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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,127	03/01/2002	Atsuhiro Kanzaki	020280	3551

23850 7590 06/22/2004

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EXAMINER	
CREPEAU, JONATHAN	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 06/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/069,127	KANZAKI ET AL.	
	Examiner	Art Unit	
	Jonathan S. Crepeau	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 March 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/1/02, 9/8/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The Supplemental European Search Report, cited in the "Other Documents" section of the Information Disclosure Statement of September 8, 2003, has not been made of record because it is an unpublished document. All other references have been made of record.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Zelinski (U.S. Patent 3,050,513). The reference teaches a butadiene polymer comprising not more than 10% 1,2-addition (i.e., 1,2-vinyl structural units) with respect to all the butadiene units in the polymer (see col. 2, line 35). The polymer is capable of being used as a binder in a lithium-ion battery, as specified in the preamble of claim 1.

Thus, the instant claims are anticipated.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 99/12221. As WO '221 was published in Japanese, U.S. Patent 6,200,707 to Takada et al. is taken as an English equivalent thereof.

The '707 reference teaches a lithium-ion battery comprising an electrode having a binder (see col. 9, line 32). Regarding claims 5 and 6, the electrode is made by forming a slurry of the polymer, a dispersion solvent, and an active material (see Example 15). Regarding claim 4, the binder may be a polybutadiene homopolymer (see abstract). Regarding claim 2, the binder may also be a copolymer comprising a 1,3-butadiene derived unit, an aromatic vinyl unit, and a methyl acrylate (i.e., carboxylic acid ester) unit (see col. 6, line 54).

While the reference teaches that the butadiene (co)polymer contains varying amounts of 1-2 vinyl bonds and is hydrogenated to a degree of over 90%, the reference does not expressly teach that the content of the 1,2-vinyl bond content after hydrogenation is in the range of 2-25 mole% with respect to the total butadiene-derived units in the polymer, as recited in claim 1.

However, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to manipulate the amount of 1,2-vinyl units and the degree of hydrogenation so as to produce a polymer having

a vinyl content within the claimed range. In column 6, line 29 et seq., the reference addresses these parameters as follows:

> The 1,2-vinyl bond content in the block A must be 15% or less. If the 1,2-vinyl bond content in the block A exceeds 15%, the cohesive force of the block A after hydrogenation decreases, which is undesireble, and the melting point also drops, which is also undesirable.
>
> In the present invention, the 1,2-vinyl bond content in the block B must be 20% or higher but not exceed 90%. If the 1,2-vinyl bond content in the block B is less than 20%, crystalline parts occur after hydrogenation and flexibility decreases, which is not desirable. On the other hand, if it exceeds 90%, the butene content increases excessively to raise the glass transition temperature; this decreases the flexibility and is not desirable.
>
> The percentage of the hydrogen added to the block copolymer, after hydrogenation, must be 90% or higher. If the percentage of the hydrogenation is less than 90%, the melting point drops and the heat resistence decreases.

Thus, the reference identifies the amount of 1,2-vinyl units prior to hydrogenation and the subsequent degree of hydrogenation as result-effective variables. Therefore, the artisan would be motivated to find optimum values of these parameters according to this guidance. It has been held that the discovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Regarding claim 3, which recites that the binder is a mixture of a butadiene homopolymer and a copolymer comprising butadiene units, the reference identifies each of these materials as suitable for the binder polymer. The courts have held that it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. *In re Kerkhoven*, 205 USPQ 1069 (CCPA 1980). As such, the subject matter of claim 3 is also not considered to distinguish over the reference.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, can be reached at (571) 272-1302. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jonathan Crepeau
Patent Examiner
Art Unit 1746
June 18, 2004